SITE PREPARATION:

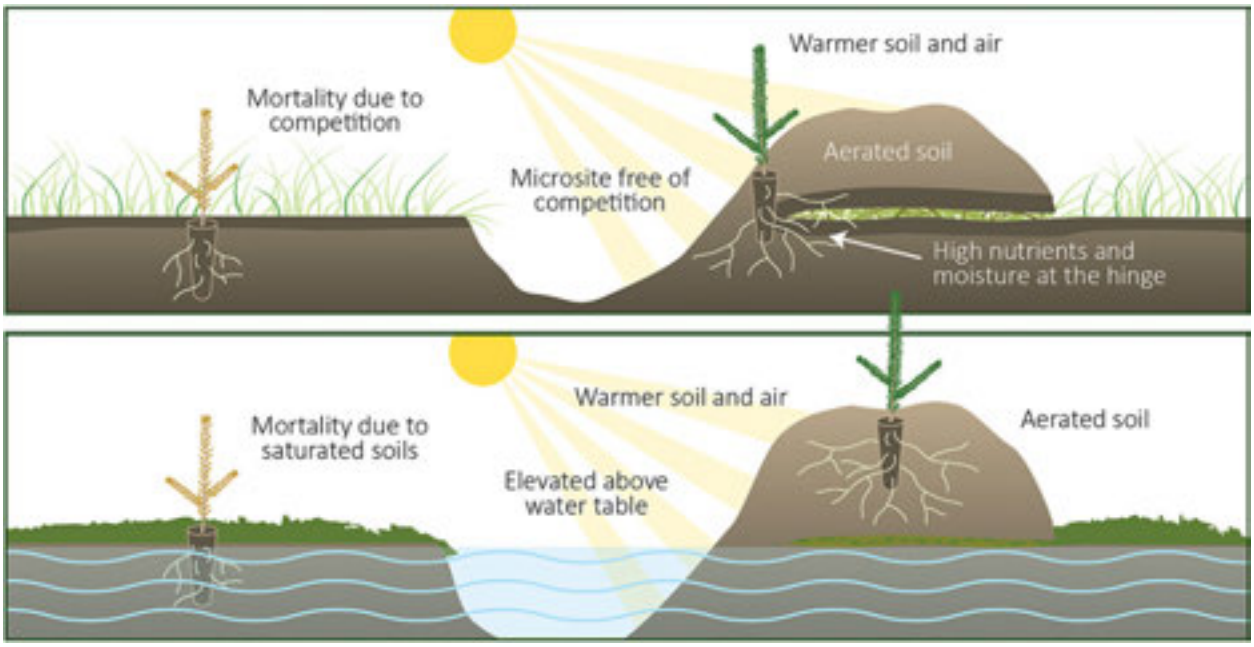
What's Holding It Back?

What's holding your site back? Work past the difficulties with site preparation.

Imagine trying to use a treadmill – but someone has removed the belt from the machine. It sounds frustrating: how are you supposed to succeed when you have been set up so poorly? You may have already struggled to garner the motivation to get to the gym, and this newfound hurdle certainly won't help you achieve your goals.

This is the situation that many tree seedlings face when attempting to establish and grow in disturbed soils. For example, a seedling attempting to take root in soil that has been compacted by machines has very little space for the roots to grow into and no air for the roots to breathe. The tree can do its best, but it will never be able to grow as big and fast as a seedling that had the good fortune of establishing on looser soil.

Using machinery to treat and restructure the soil - called site preparation - helps to increase the likelihood of those good conditions. It can also provide seedlings the leg-up they need to outcompete other vegetation on reclaimed sites.

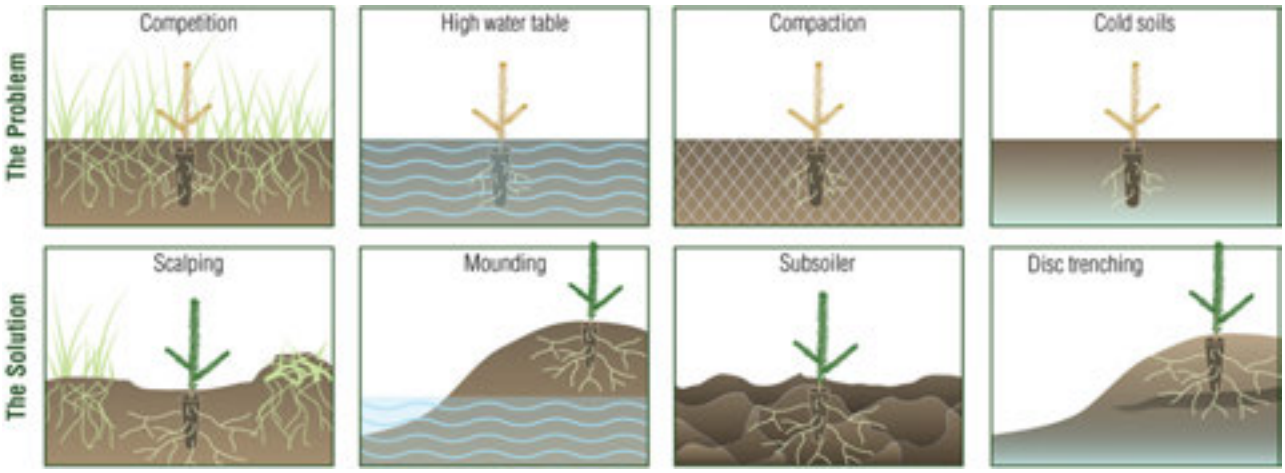


Site conditions that make it difficult for plants to grow and establish, such as large amounts of competing vegetation (top) or too-wet conditions (bottom), can be improved with the appropriate site preparation method.

Convenient conditions for seedlings do not need to be a matter of luck: with the proper site preparation, it is possible to make sure that the majority of seeds or seedlings find good conditions to grow in.

The secret to site preparation success is **knowing your site:** what conditions are present that might make it tricky for seeds to grow? There are four main problems to look out for during a site assessment:

- **Compacted soils** make it hard for roots to grow, like the treadmill example above.
- **Competition from other plants** reduces growing space, light and nutrient availability. Imagine trying to work out at the gym, but there is another person using every single machine!
- **Soils that are too wet or too dry** can prevent trees from getting the air and nutrients they need to perform well. Trying to grow in too-wet soil would be like trying to work out with a heavy weight on your chest - you can breathe harder, but it is still tough to fill your lungs.
- **Cold soils** slow root growth. What if the thermostat at the gym was always set to -10°C? It would be much harder to get warmed up and move efficiently.



The key conditions that make it difficult for plants to grow and establish: competition, soil moisture, soil compaction, and cold soils (top). Each of these tricky conditions can be addressed by using the appropriate site treatment (bottom).

These types of conditions are called **site limiting factors**. They limit the ability of plants to re-grow and establish.

The nice thing about site limiting factors is that once you know what the problem is, it's quite easy to resolve.

- **Compacted soils:** loosen up the soil (in our gym example: add a belt to the treadmill)
- **Competition:** reduce competing vegetation (set a limit to how many people can use the gym at one time)
- **Too-dry soil:** lift the growing spot above the water (remove the weight on the person's chest to let them breathe)
- **Cold soil:** expose growing surfaces up to the sunlight, e.g. mounding (increase the thermostat)

This is how site preparation works when it is done well: site preparation **addresses specific concerns on the site**, helping target plants to grow better. On the other hand, if the site treatment doesn't match the problem, it won't be able to solve the issue - no matter how well-intentioned.

Key takeaways:

- Site preparation methods need to match the problem: pick the site preparation method that addresses the **site limiting factors** on your site.
- When the method matches the problem, site preparation makes conditions better for seedlings and helps them establish more quickly.

Want to know more of the details and how to implement site preparation effectively on your tenure? Check out these handy resources:

- Silviculture Toolkit Video: An Overview of Site Preparation
- Silviculture Toolkit Factsheet: A Guide to Site Preparation / Guide sur la préparation de site

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This blog series was created in collaboration with Natural Resources Canada and Fuse Consulting Ltd.